



## TANGRAMS

The invention of the tangram puzzle is unrecorded in history. The earliest known Chinese book is dated 1813 but the puzzle was very old by then. One reason for this could be that in China, its country of origin, at the time it was considered a game for women and children. This would have made it unworthy of "serious" study and unlikely to be written about. However, there is a lot of good math hiding in this Chinese puzzle of tangrams. Different times, different ways of thinking. Glad that's changing.

The **tangram** (Chinese: 七巧板; pinyin: qī qiǎo bǎn; literally "seven boards of skill") is a dissection puzzle consisting of seven flat shapes, called *tans*, which are put together to form shapes. The objective of the puzzle is to form a specific shape (given only in outline or silhouette) using all seven pieces, which may not overlap.

<http://en.wikipedia.org/wiki/Tangram>

Want to learn more about tangrams?

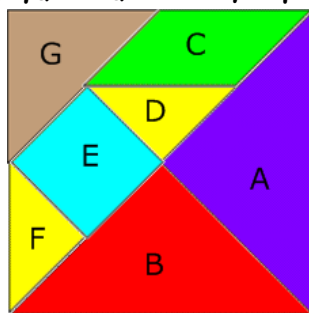
<http://tangrams.ca>

[http://www.ehow.com/video\\_4411802\\_the-basics-tangram-shapes.html](http://www.ehow.com/video_4411802_the-basics-tangram-shapes.html)



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## Make a set of TANGRAMS...



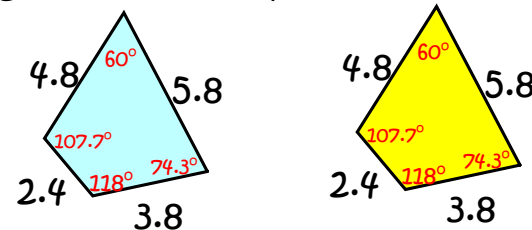
1. Cut out a square with sides that are 4" long.
2. Cut along one of the diagonal of the square to form 2 right triangles.
3. Take one of the triangles and fold it in half to form triangles A and B.
4. Find the midpoint of the hypotenuse of the other large right triangle. Use this point to make a fold to complete and cut out triangle G.

5. Take the leftover trapezoid and find the line between D and E, making two congruent trapezoids. Cut the two trapezoids apart.

6. Find the midpoints of each of the long bases of the trapezoids. From one, fold parts C and D and from the other, parts E and F.

## Congruent Polygons ( $\cong$ )

Two items are said to be congruent if their corresponding angles have equal measures and their corresponding sides have the same length. (same shape and same size)





True or False?

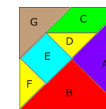
False

Pull the True or False into the checker box to see if you are correct.

These shapes are congruent... True False

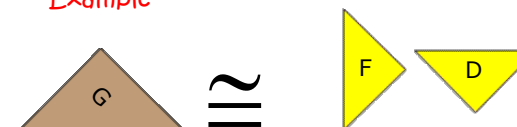
1. Two squares with sides 5 cm and 7 cm.
2. A right triangle with legs 3 cm and 4 cm and a right triangle with a leg of 4 cm and hypotenuse of 5 cm.
3. Two isosceles triangles with 10 in. legs.
4. A circle with a radius of 7 feet and a circle with a diameter of 14 feet.

## Tangrams



Arrange the tangram pieces given to make CONGRUENT triangles.

Example

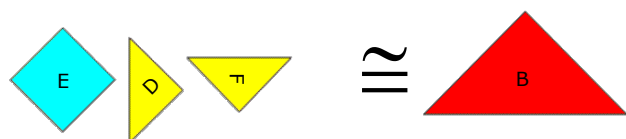
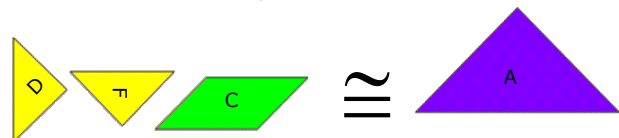
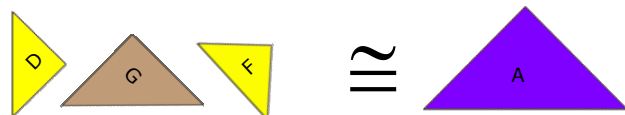


Click here to reveal the answer

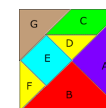
## Tangrams



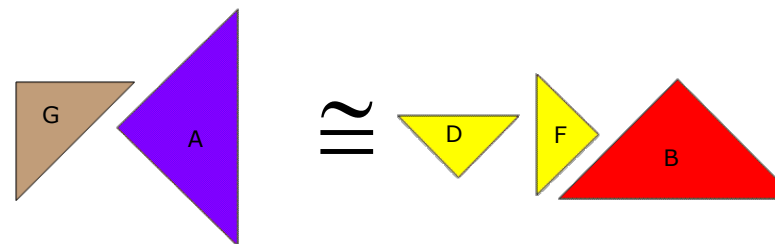
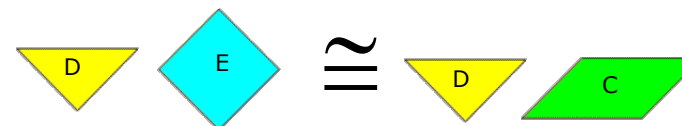
Arrange the tangram pieces given to make congruent triangles.



## Tangrams

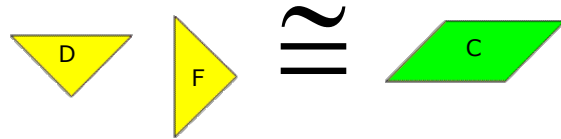
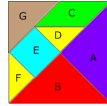


Arrange the tangram pieces given to make congruent trapezoids.



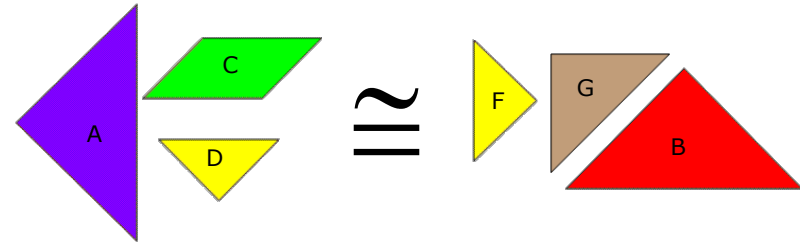
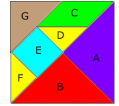
## Tangrams

Arrange the tangram pieces given to make congruent **parallelograms**.



## Tangrams

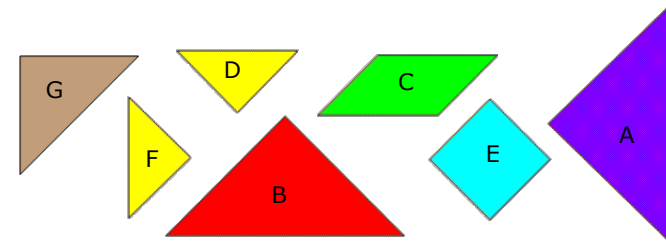
Arrange the tangram pieces given to make congruent **pentagons**.



## Congruence Challenge Problems

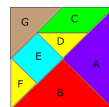
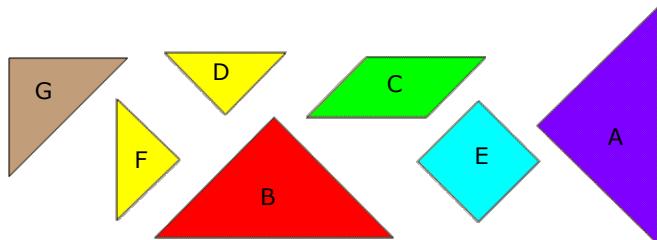
### Challenge Problem

1. Use ALL 7 pieces to form two CONGRUENT **triangles**.



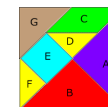
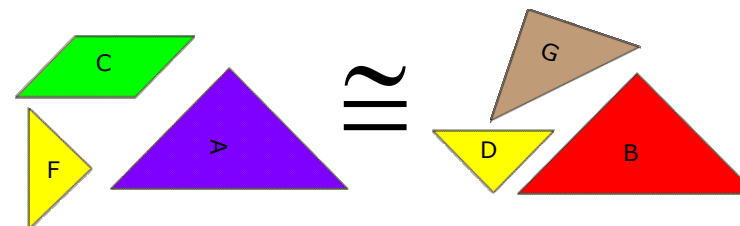
## Challenge Problem

2. Use ALL 7 pieces to form two CONGRUENT squares.



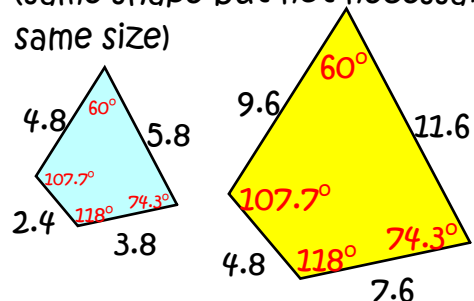
## Challenge Problem

3. Find the following pieces and form CONGRUENT pentagons.



## Similar Polygons (~)

Two items are said to be congruent if their corresponding angles have equal measures and their corresponding sides are proportional. (same shape but not necessarily the same size)



True or False?

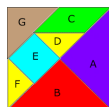
Pull the True or False into the checker box to see if you are correct.

These shapes are similar...

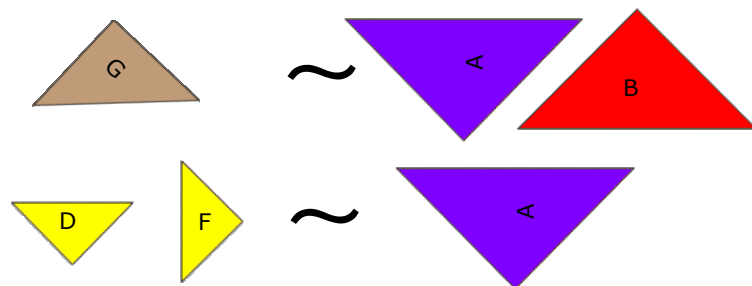
True False

- Two squares with sides 5 cm and 7 cm.
- A triangle with sides 3 cm, 4 cm, and 5 cm and any right triangle.
- A rectangle with sides 4 in. and 8 in. and a rectangle with sides 6 in. and 10 in.
- A circle with a radius of 7 feet and a circle with a diameter of 14 feet.

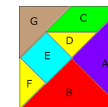
# Tangrams



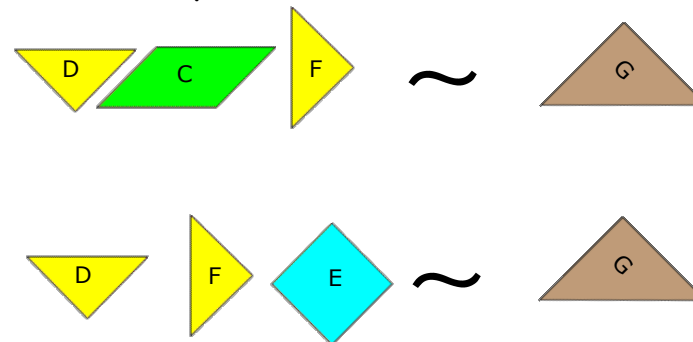
Arrange the tangram pieces given to make **SIMILAR triangles**.



# Tangrams



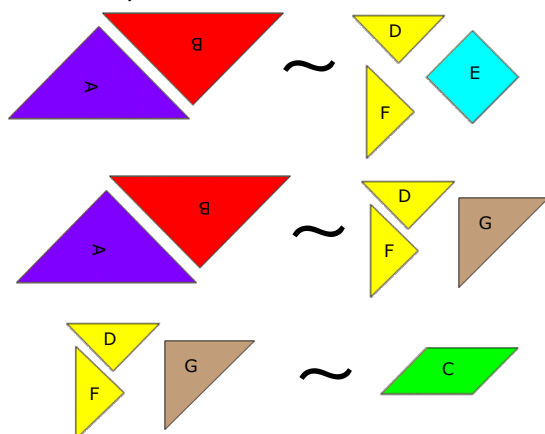
Arrange the tangram pieces given to make **SIMILAR triangles**.



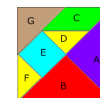
# Tangrams



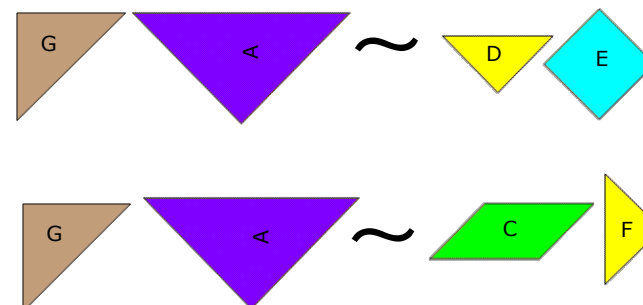
Arrange the tangram pieces given to make **SIMILAR parallelograms**.



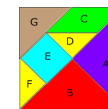
# Tangrams



Arrange the tangram pieces given to make **SIMILAR trapezoids**.

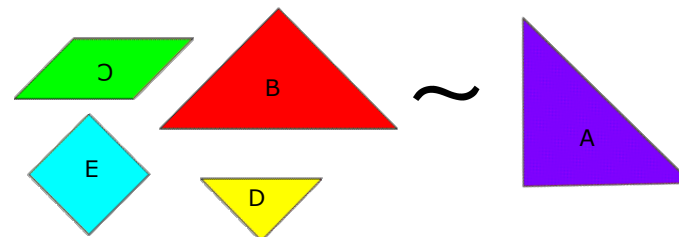


# Similarity Challenge Problems



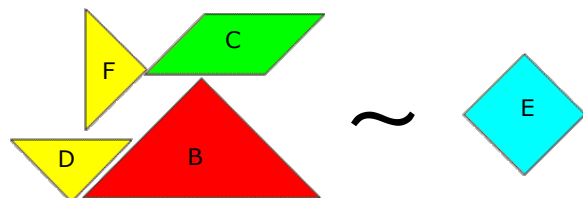
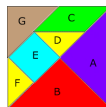
## Challenge Problem

1. Using the following pieces, form two **SIMILAR** triangles.



## Challenge Problem

2. Use the pieces below to form **SIMILAR** squares.



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## Attachments

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Tangrams-Congruence Similarity.pdf